

Patent Number: JP56143416
Publication date: 1981-11-09
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Requested Patent: JP56143416
Application Number: JP19800046771 19800411
Priority Number(s):
IPC Classification: G02F1/17; C09K9/00; G09F9/00
Equivalents:

Abstract

PURPOSE: To prevent EC material from deteriorating and prolong the life by using noble metal electrodes in which the plane roughness of the electrodes is kept below specific conditions in a solution type electrochromic display (ECD) element using viologen type compounds.

CONSTITUTION: In lining Cu on both surfaces of, for example, a lower plastic substrate 5, and providing a display electrode 1 and a counter electrode 2 thereon, copper wires are buried in through-hole parts 3, and the Cu surface is plated with Ni after polished and plated thereon Au, and the surface thereof is finished to smoothness of $\leq 0.3\mu$ surface roughness by buffing or the like. Next, an upper glass substrate 7 is joined thereto by way of a spacer 9. A viologen type EC material is injected through injection ports 8, after which the ports are sealed. Stagnating of the viologen compound in the rugged parts of the electrodes, if they are rough, and its deteriorating owing to the concentration of electric fields, hence staining of the electrodes are prevented by finishing the surfaces of the electrodes 1, 2 to the smoothness of $\leq 0.3\mu$ average roughness in this way. Thus, the repetitive display life is improved to about 2-10 times of the case when the smoothness is rough, and the secular change of display density is virtually eliminated.

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